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Remarks

The case as amended contains 9 total claims, of which 5 are in independent form. Six independent claims were previously paid for, and therefore no fee is believed to be due with this response.

Claims 9 and 18 have been amended to specify details concerning the isocyanate-terminated prepolymer (claim 9) and isocyanate-reactive compound (claim 18). Support for the newly added limitations of claim 9 is found in original claims 11 and 12, and further at page 6 lines 16-18 of the specification. The newly added limitations of claim 9 are also found at page 6 lines 16-18 of the specification.

Claim 15 has been amended to depend from claim 18, and therefore incorporates the limitations of the latter claims.

Claims 11 and 12, 16 and 17 have been canceled.

Regarding the Rejections under 35 USC §102(b)

The examiner is requested to reconsider these rejections in view of the newly amended claims.

The invention as now claimed is a prepolymer that is the reaction product of a polyisocyanate and a specific functionalized oil. The functionalized oil is the reaction product of tung oil and a polyol. The polyol contains at least three primary hydroxyl groups and has a melting temperature of no more than 220°C.

As explained in the current specification, tung oil has highly reactive unsaturation. Because the unsaturation is highly reactive, functionalized tung oils have been very difficult to produce. This is because the conditions required to transesterify the tung oil with commonly used polyols cause the unsaturated groups of the tung oil to react, causing an increase in product viscosity and a badly discolored product. See page 2, lines 4-12 of the specification. What the applicant has found is that this problem can be avoided, if certain polyols are used to functionalize the tung oil. See page 6 lines 15-24 of the specification. The present claims now specify the particular combination of tung oil and a specific class of polyols.

This combination is not described or suggested in any of the cited references. What the references have in common is that they describe various types of functionalized oils (or functionalized fatty acids). They all mention tung oil or a fatty acid with conjugated double bonds, in a laundry list of possible oils that include many types that do not contain

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conjugation. However, in each case, they fail to disclose the specific combination of tung oil with a polyol having at least three primary hydroxyl groups and a melting temperature of not more than 220°C.

It is notable that in each case, the reference contains no working examples with tung oil or a similar fatty acid, *i.e.*, one having three or more carbon-carbon double bonds in conjugation. This is despite the ready availability of tung oil as a product of commerce for a very long time. It is believed that this reflects the difficulty of producing a functionalized tung oil, due to the high reactivity of its conjugated double bond system.

Therefore, none of the cited references provides a solution to the problem of producing a functionalized tung oil.

More specifically, US 3,318,828 discloses a prepolymer made from functionalized oils. US 3,318,828 describes at least 13 oils and 11 specific polyols that can be used to make the functionalized oil. Only 1 of those 11 polyols meets the requirements of the present claim, *i.e.*, at least 3 primary hydroxyl groups and a melting temperature below 220°C. To reach the present invention from US 3,318,828, therefore requires a selection of one out of 143 (13 times 11) possible combinations. US 3,318,828 does not teach or suggest to make this particular combination.

As to claims 15, 18 and 19, US 3,318,828 does not describe aqueous dispersions of any kind. All of the materials described in US 3,318,828 are oil-soluble.

Similarly, US 3,758,427 describes a wide range of starting fatty acids and oils, which can be reacted with a wide range of polyols to produce a functionalized oil product. The polyols are described at the bottom of page 7 and top of page 8. Of the 24 specific materials named there at most only 3 (trimethylolethane, trimethylolpropane and possibly the ethoxylated pentaerythritol) have at least three primary hydroxyl groups and a melting temperature of below 220°C. US 3,758,427 does not teach or suggest making the particular selection of tung oil together with the correct polyol, out of this myriad of possible combinations. Such a selection can come only with hindsight.

US 3,412,054 does not describe a functionalized tung oil. In US 3,412,054, the constituent fatty acids are obtained from the oil, and used as a starting material. It appears that the fatty acids can be reacted directly with the polyisocyanate (see ex. 1 and 2), or that they can be pre-reacted with a 2,2-di(hydroxylmethyl)alkanoic acid, optionally in the presence of another polyol, before reacting with the polyisocyanate (Ex. 3-8). US 3,412,054 lists 12 such other polyols at the bottom of column 2. Of these 12, only two have

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at least three primary hydroxyl groups and a melting temperature of below 220°C. Again, there is no teaching or suggestion to select the particular combination of tung oil with either of these two specific polyols, in order to reach this invention.

It is therefore believed that the claims as amended define subject matter that is both novel and unobvious over each of the cited references.

Respectfully submitted,  
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